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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/979,505	01/11/2002	Takatomo Sasaki	2001-1739A	5933

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EXAMINER

SONG, MATTHEW J

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 08/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/979,505	Applicant(s) SASAKI ET AL.	
	Examiner Matthew J Song	Art Unit 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/16/2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 19-20 and 33-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishizawa (US 4,874,458).

Nishizawa discloses a Czochralski method of growing a single crystal, note entire reference, comprising a baffle member 16 in a raw material melt in a crucible 7 where polycrystalline GaAs is place in the crucible and a heating means 11 is used to melt the GaAs and a rod 8 was rotated to have a seed crystal contacted thoroughly with the feed melt 12, while the crucible is rotated in the opposite direction and a single crystal is pulled in the vertical direction (col 7, ln 1-67 and col 5, ln 1-67). Nishizawa also discloses the crucible and/or the baffle plate is rotated during the single crystal pulling operation, this reads on applicant's without rotating the baffle member when growing the single crystal (col 3, ln 10-25). Nishizawa discloses growing a single crystal by the Czochralski method of contacting a seed crystal with a raw material melt and pulling a crystal vertically; it is inherent to the Czochralski to grow a crystal by slowly cooling the raw material melt with which the seed crystal makes contact below liquid level to precipitate a single crystal on the surface of the seed crystal. Also Nishizawa discloses a plurality of heaters 11a, 11b, 11c, 11d, which control the temperature of the crucible

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in the vertical direction, which reads on applicant's cooling mechanism. Nishizawa also teaches a baffle plate with guide portions **16a**, which functions to stir the feed melt on the baffle plate (col 6 and Fig 2); the guide portions **16a** reads on applicant's plurality of baffle plate fragments because of similar structure and a similar function of stirring.

Referring to claim 20, Nishizawa discloses rotating the seed crystal (col 7, ln 30-45).

Referring to claim 33, Nishizawa discloses a baffle member **16** arranged in the crucible **7**, a rotating material for rotating the crucible **5** and a seed attached to a crystal pulling rod which cools a raw material melt to form a single crystal and a plurality of heaters **11a, 11b, 11c, 11d**, this reads on applicant's cooling mechanism.

Referring to claim 34, Nishizawa discloses a rotation drive mechanism **9** for rotating a crystal pulling rod which is attached to a seed crystal (col 5, ln 10-40).

Referring to claim 35, Nishizawa discloses the baffle plate is held by control rods **18**, which are independent from the crucible (col 5, ln 35-45 and Fig 1), therefore the crucible rotates without rotating the stirring member.

3. Claims 33-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Atami et al (US 5,871,581).

Atami et al discloses a crystal growing apparatus, note entire reference, comprising a baffle member **31**, this reads on applicant's stirring member, arranged in a raw material melt in a crucible **3**, which is mounted on a susceptor **15**, which sits on a vertical shaft **14** and can be rotated in a horizontal plane, this reads on applicant's rotating member. Atami et al also discloses a seed crystal of the single crystal of the semiconductor is attached to a pulling wire and is

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immersed in a semiconductor melt and then raised up and a grown single crystal of the semiconductor is pulled up in an inert atmosphere, this reads on applicant's cooling mechanism for slowly cooling the raw material melt because dipping the seed crystal causes the melt to cool to a solid state (col 2, ln 1-67 and col 3, ln 1-67 and Fig 1). Atami et al also discloses a plurality of baffle plates 32, this reads on applicant's plurality of baffle fragments (col 4, ln 25-40 and Fig 2) and a continuous spiral type plate can also be used instead of using a plurality of baffle plates positioned independently below the other, this spiral plate reads on applicant's blade member having a screw form (col 4, ln 50-55).

Referring to claim 34, Atami et al also discloses a pulling wire 24 which forms part of a pulling mechanism is configured so as to movable up and down with continuous rotation and a seed crystal is attached to the pulling wire (col 3, ln 10-25), this reads on applicant's mechanism for rotating the seed crystal.

Referring to claim 35, Atami et al discloses the baffle plate is supported from the source material supply tube 5 (col 4, ln 1-10 and Fig 1), therefore because the crucible is rotated by a susceptor 15 and the baffle is supported by the supply tube, which is independent from the crucible, the susceptor rotates the crucible without rotating the baffle.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 21-24 and 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishizawa (US 4,874,458) in view of Sasaki et al (EP 0786542 A1)

Nishizawa discloses all of the limitations of claim 5, as discussed previously, except a single crystal of oxide is grown.

In a method of forming a crystal, note entire reference, Sasaki et al teaches a cesium lithium borate crystal ($\text{CsLiB}_6\text{O}_{10}$) was grown by a seeding method (Example 1). Sasaki et al also teaches doping of a crystal by through mixing of compounds such as oxide and carbonates during preparation of a crystal, where Al and Ga are used as dopants to form $\text{Cs}_{1-x}\text{Li}_{1-y}\text{M}_{x+y}\text{B}_6\text{O}_{10}$ (pg 3, col 15-55 and claim 1). It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Nishizawa with Sasaki et al to grow a cesium-lithium borate crystal, which is useful as a wavelength converting nonlinear optical crystal for a laser oscillator (pg 2, ln 5-10).

6. Claim 21, 22, 25, 27, 28 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishizawa (US 4,874,458) in view of Furuya et al (Development of New Nonlinear Optical Crystal GdYCOB with Tunable Birefringence).

Nishizawa discloses all of the limitations of claim 5, as discussed previously, except a single crystal of oxide is grown.

In a method of forming a crystal by the Czochralski method, Furuya et al teaches a $\text{Gd}_x\text{Y}_{1-x}\text{Ca}_4\text{O}(\text{BO}_3)_3$ grown by the Czochralski method (Abstract). It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Nishizawa with Furuya

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et al to form a $\text{Gd}_x\text{Y}_{1-x}\text{Ca}_4\text{O}(\text{BO}_3)_3$ crystal which is useful in controlling the birefringence in nonlinear optical crystals.

7. Claims 21, 26, 27, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishizawa (US 4,874,458) in view of Nitanda et al (US 5,359,452).

Nishizawa discloses all of the limitations of claim 5, as discussed previously, except a single crystal of oxide is grown.

In a method of forming a crystal, note entire reference, Nitanda et al teaches a LiTaO_3 mixture is placed into a crucible and melt and then a seed was then dipped into the melt to grow a monocrystal by the Czochralski method (Embodiment 2). It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Nishizawa with Nitanda et al to form a Lithium Tantalate monocrystal, which is useful in surface acoustic elements (col 3, ln 50-67).

Response to Arguments

8. Applicant's arguments filed 6/16/2003 have been fully considered but they are not persuasive.

Applicant's argument that Nishizawa does not disclose a stirring member selected from a baffle member comprising a plurality of baffle plate fragments has been considered but is not found persuasive. Nishizawa discloses a baffle plate with guide members **16a** used for stirring (Fig 2 and col 6, ln 55-57). The baffle plate with guide members taught by Nishizawa read on applicant's stirring member comprising a plurality of baffle plate fragments.

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In response to applicant's argument that the baffle plate of Atami are for restricting flow, not for stirring, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). Atami discloses a plurality of plates 32, this reads on applicant's plurality of baffle plate fragments and Atami also discloses a spiral type plate can also be used as a baffle, this reads on applicant's screw form. The baffle plates taught by Atami are inherently capable of performing the intended use of stirring because Atami discloses a similar structure for the stirring member, as instantly claimed.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Metter (US 5,683,281) teaches in a Czochralski technique a seed crystal is immersed in a molten pool of silicon and this triggers solidification and precipitation of silicon (col 1, ln 10-67), therefore immersing a seed crystal inherently cools the raw material melt to a temperature which triggers solidification.

Sasaki et al (US 6,296,784) teaches a cesium lithium borate crystal and forming borate crystals using crystal pulling methods (col 2-4).

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Jiyunji (JP 63-159284) teaches a crystal pulling up device comprising a rotating member baffle member without rotating a seed crystal (Abstract).

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J Song whose telephone number is 703-305-4953. The examiner can normally be reached on M-F 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 703-305-2667. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Matthew J Song
Examiner
Art Unit 1765

MJS
August 12, 2003

NADINE G. NORTON
PRIMARY EXAMINER
Nad Norton